

*(Per ILA Approval Requirements)*

**CA Approval**  
 **JB Approval**

## **REGIONAL FARE COORDINATION SYSTEM**

### **CHANGE ORDER NO. 14**

**CONTRACTOR:** **ERG Transit Systems (USA) Inc.**  
**CONTRACT NUMBER:** **229944**

This Change Order to Contract #229944 ("Change Order") is executed as of 11/14/05, by and between ERG Transit Systems (USA) Inc, a California corporation and wholly owned subsidiary of ERG Limited, an Australian corporation, (hereinafter referred to as the "Contractor") and each of the following seven public transportation agencies (hereinafter referred to individually as an "Agency" or collectively as the "Agencies"):

1. Central Puget Sound Regional Transit Authority ("Sound Transit")
2. King County ("King County")
3. Kitsap County Public Transportation Benefit Area ("Kitsap Transit")
4. Pierce County Public Transportation Benefit Area ("Pierce Transit")
5. Snohomish County Public Transportation Benefit Area ("Community Transit")
6. City of Everett ("Everett")
7. State of Washington, acting through the Washington State Department of Transportation, Washington State Ferries Division ("WSF")

#### **Background**

- A. Effective April 29, 2003, each of the Agencies and the Contractor entered into Contract #229944 ("Contract") to implement a Regional Fare Coordination System ("RFC System") to establish a common fare system utilizing smart card technology. The Contractor is responsible for the development, implementation, operation and maintenance of the RFC System as specified in the Contract.
- B. The Agencies and the Contractor desire to execute this Change Order No. 14 to modify the Contract as needed to be consistent with certain design decisions that have been made regarding the on-board architecture and the LonWorks port.

## Agreements

The Agencies and the Contractor hereby agree to the following changes to the Contract:

### **1.0 Removal of LonWorks Port**

Sections 6.III-3.6 (introduction) and 6.III-3.6.1 are hereby amended as follows:

#### **6.III-3.6 Data Exchange Requirements**

All software and fare table updates shall be uploaded through the RFC system, and shall not require manual data upload from a laptop computer, memory card, disk or other means.

The FTP clock shall be synchronized via the DACS clock. Synchronization shall occur during data on and off loads.

##### **3.6.1 Communication Ports**

- (a) The FTP shall include as a minimum the following ports:
  - i. A high speed serial port to provide the primary data connection to the FTP.
  - ii. An RS232 port for diagnostics and back-up data transfer.
- (b) The Contractor shall provide a Communications Interface Specification (DR 102.04) for the FTP. This specification shall include a description of the data elements and communication protocols for all ports.
- (c) The Communications Interface Specification shall also describe the data elements and communications protocols for any additional communication ports required by specific FTP configurations per Sections 6.III-4, 6.III-8, and 6.III-9.

### **2.0 Changes to On-Board Architecture**

Section 6.III-4.1 is amended to read as follows:

#### **6.III-4 On-Board Fare Transaction Processor (OBFTP)**

##### **6.III-4.1 Subsystem Description - OBFTP**

The Contractor shall provide On-Board Fare Transaction Processors (OBFTP) allowing fare cards to be read and encoded through the contactless interface during the fare payment process on-board Agency buses. The OBFTP shall consist of a CPU for processing transactions, memory for storing fare tables and transaction records, customer display, and card reader (DR 102.05).

The OBFTP shall be capable of operating, when delivered, in a limited integration mode (LIM) or as a plug-n-play peripheral in full integration mode (FIM) on an on-board network to be provided by others. Initially, the Agencies expect to operate the OBFTPs with a limited degree of integration, and then migrate to a full integration mode when an on-board Vehicle Logic Unit (VLU) is developed and installed by others (see Section 6.III-5).

A flexible architecture for the OBFTP (DR 102.06) is required to allow each agency to migrate from the limited integration mode to the full integration mode at any time in the future, and to accommodate on-board integration requirements that vary by Agency. The OBFTPs, when delivered, shall be capable of supporting the following two modes of operation, and shall be designed to allow migration from limited to full integration mode without hardware or operating/RFCs application software changes.

The Ethernet switch will be installed as per Section 6.II-11.3 for the purpose of providing an environment that allows for developing a modular on board architecture as per contract clause 6.III-3.4.6. When installed, the Ethernet switch will function as the communications switch for all on-board system traffic for fare collection purposes. The Ethernet switch shall provide communications between the OBFTP, DDU, and VLU in full integration mode. The OBFTP and DDU shall transfer data through the VLU to the WDOLs when communicating on and off the vehicle in FIM.

#### 4.1.1 Limited Integration Mode (LIM)

In the Limited Integration Mode, the OBFTP shall store transactions until communication with the WDOLs is established and data transfer can be completed. The OBFTP shall connect to other on-board devices as illustrated in Figures III-4.1 and III-4.2.

**Figure III-4.1 (KCM)  
On-Board LIM Architecture for KC Integration**

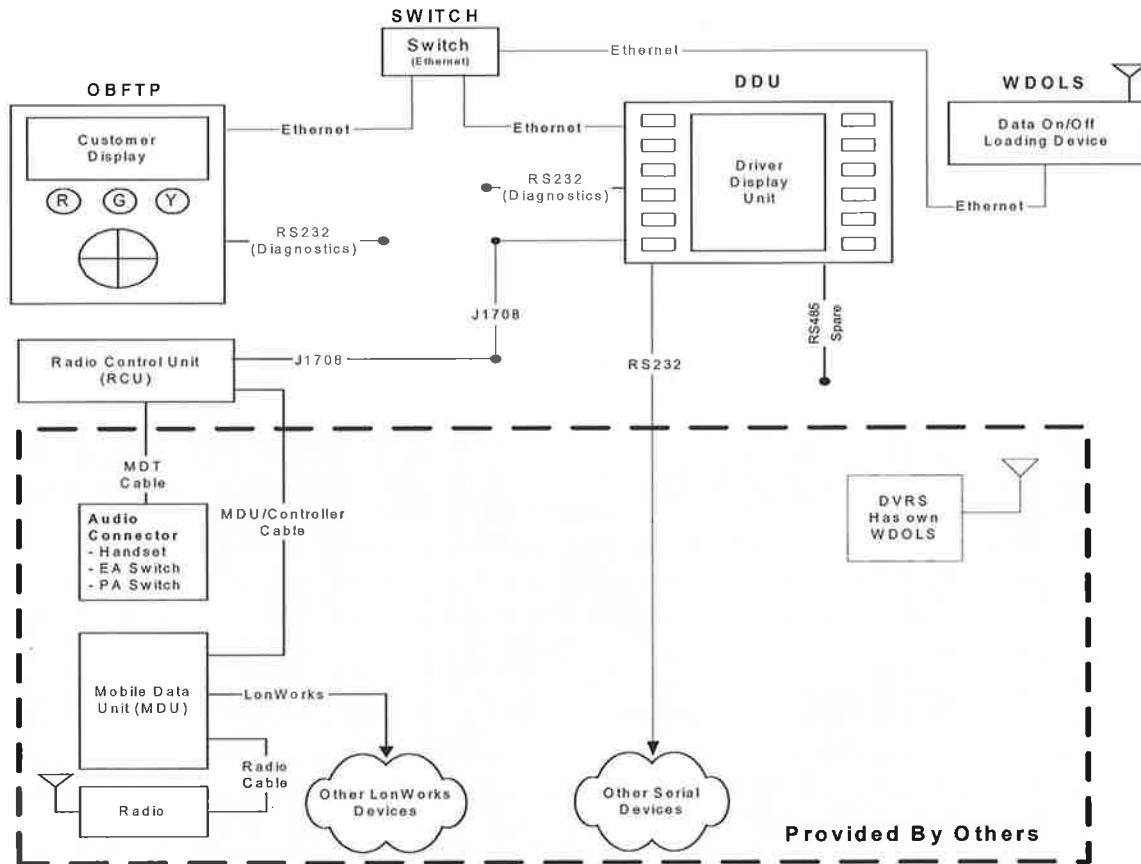


Figure III-4.2 identifies the module interfaces that apply to the Limited Integration Mode (LIM).

**Figure III-4.2  
MODULE INTERFACE SUMMARY - LIM**

Module	DDU	WDOLS	VLU	Radio Control Unit	GFI Farebox (Option)
OBFTP	Ethernet/High Speed Serial	N/A	N/A	N/A	N/A
DDU		Ethernet/High Speed Serial	N/A	J1708	J1708
WDOLS			N/A	N/A	N/A
ETHERNET SWITCH	Ethernet/High Speed Serial	Ethernet/High Speed Serial	N/A	N/A	N/A

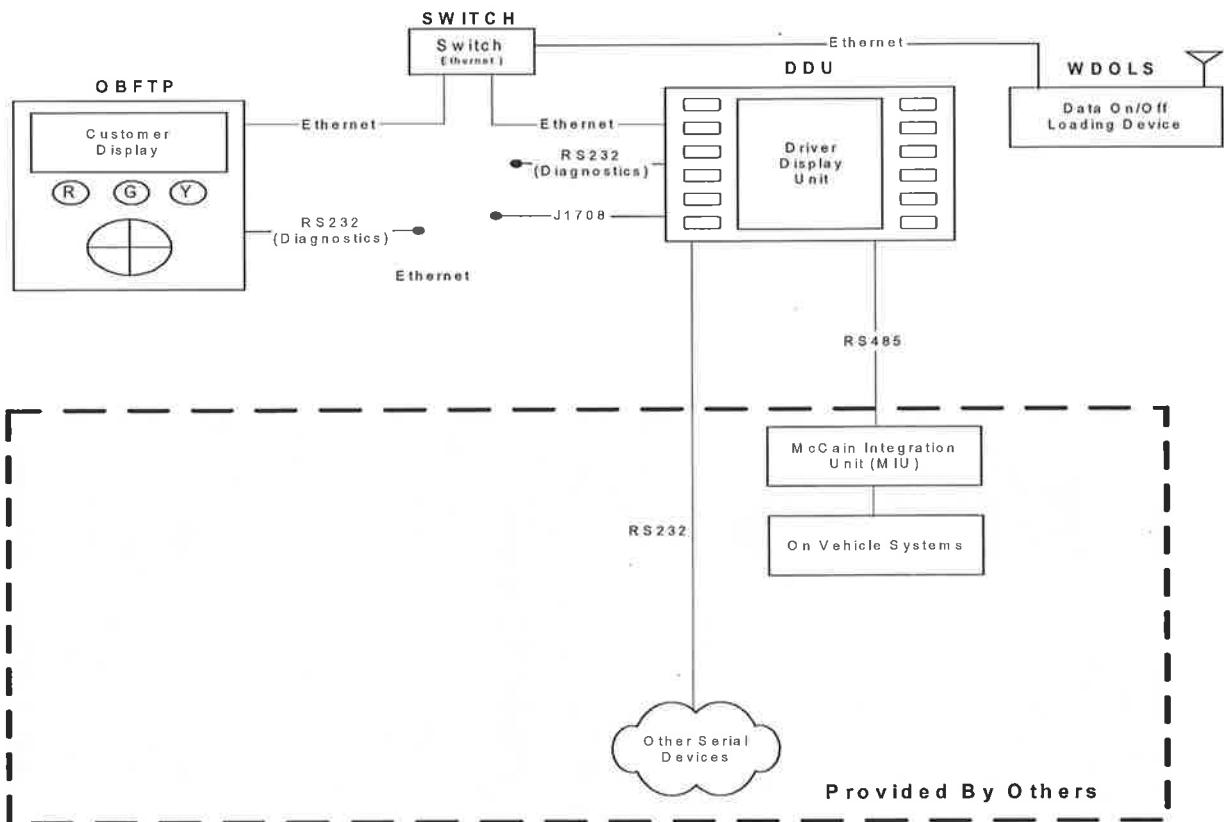
#### **4.1.2 Full Integration Mode (FIM)**

In the Full Integration Mode, when the VLU is available (provided by others), the OBFTP shall store transactions until communication with the WDOLS is established (Via the VLU) and data transfer can be completed. The OBFTP, DDU and WDOLS shall be connected as illustrated in Figures III-4.3 and III-4.4.

The Ethernet switch is the interface between the OBFTP, DDU and VLU. The VLU shall send (if available) location data, trip changes, fareset changes and synchronization to the DDU. The DDU will forward the information from the VLU to the OBFTP. An Ethernet/High Speed Serial interface shall be used for on/off-loading data via the WDOLS. The VLU will tunnel RFCS data from the OBFTP to the WDOLS.

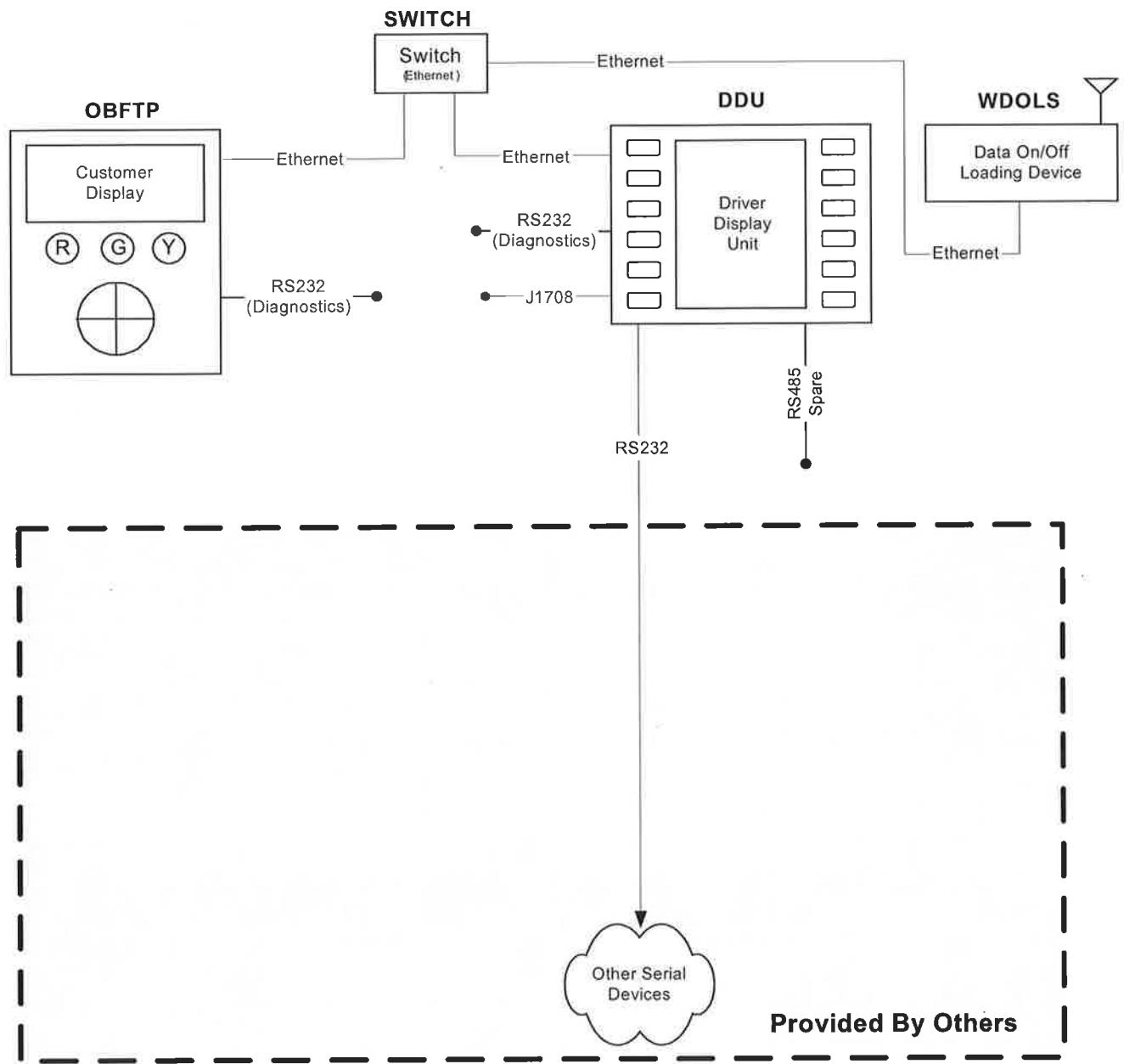
Figure III - 4.3 (C T)

On-Board Architecture for CT Integration



**Figure III - 4.3 (PT/ET/KT)**

**On-Board Architecture for PT, ET, and KT Integration**



**Figure III - 4.3 (KCM)**

**On-Board Architecture (FIM) for KCM Integration**

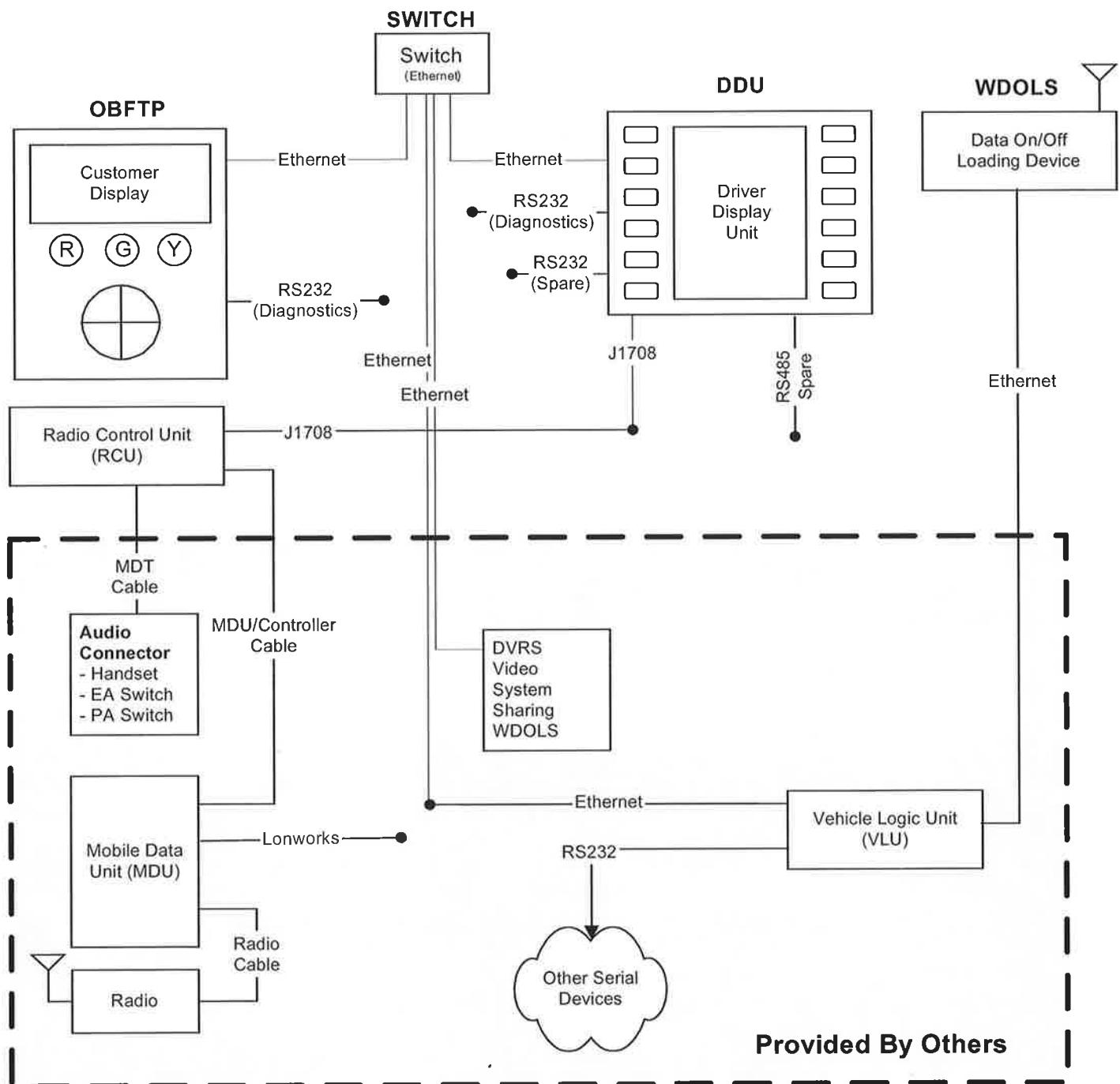


Figure III-4.4 identifies the module interfaces that apply to the Full Integration Mode (FIM). The Contractor may suggest alternative on-board configurations in addition to the configuration provided, subject to the review and approval of the Contract Administrator.

**Figure III-4.4  
MODULE INTERFACE SUMMARY – FIM**

Module	DDU	WDOLS	VLU	Radio Control Unit	GFI Farebox (Option)
OBFTP	N/A	N/A	Ethernet/High Speed Serial	N/A	N/A
DDU		N/A	Ethernet/High Speed Serial	J1708	J1708
WDOLS			Ethernet/High Speed Serial	N/A	N/A
ETHERNET SWITCH	Ethernet/High Speed Serial	N/A	Ethernet/High Speed Serial	N/A	N/A

### **3.0 Other Terms and Conditions**

Except as expressly amended by this Change Order, the Contract remains in full force and effect. All other provisions of the Contract not referenced in this Change Order No. 14 shall remain in effect unless modified in other executed Amendments and Change Orders.

IN WITNESS WHEREOF, the parties hereto have executed this Change Order No. 14 to Contract #229944 as of the date set forth below its signature.

**ERG Transit Systems (USA) Inc.**

By: Patrick Braud  
Its: PROJECT MANAGER  
Date: November 11, 2005

**The Agencies**

By: Constance Carlson  
Their: Contract Administrator  
On behalf of the Agencies  
Date: 11/14/05